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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,896	03/06/2006	Peter Albersheim	102-02	9920

23713 7590 10/25/2007  
GREENLEE WINNER AND SULLIVAN P C  
4875 PEARL EAST CIRCLE  
SUITE 200  
BOULDER, CO 80301

EXAMINER
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KIM, TAEYOON

ART UNIT	PAPER NUMBER
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1651

MAIL DATE	DELIVERY MODE
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10/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/553,896

Applicant(s)

ALBERSHEIM ET AL.

Examiner

Taeyoon Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 34-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 34-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment and response filed on Aug. 23, 2007 has been received and entered into the case.

Claims 1-33 and 46 are canceled, and claims 34-45 are pending and have been considered on the merits. All arguments have been fully considered.

### ***Response to Arguments***

Applicant's arguments filed 8/23/07 have been fully considered but they are not persuasive. Applicant argued in regard to the rationale of the previous office action that process steps could be performed in any order in the absence of new or unexpected results. Applicant asserted that the steps conducted in the claimed method are distinct from those of Teeri et al. because the species that is subjected to hydrolysis in the current invention is a modified xyloglucan polymer whereas in Teeri et al., the species is unmodified xyloglucan polymer. Further applicant argued that the order of mixing non-reactive ingredients most often will not lead to a change in the properties of the mixture prepared, but when the component that are being mixed are reactive chemical species the order of addition of such species can result in significant differences in the chemical nature of the species in the mixture.

This arguments are not persuasive because application failed to show that the specific order of the method steps claimed in the current invention would have new or unexpected results different from the order of the method steps disclosed in Teeri et al. As discussed in the previous office action, and especially according to M.P.E.P.

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§2144.04 (In re Burhans), without such new or unexpected results derived from the specific order of process steps, it would have been obvious to a person of ordinary skill in the art to perform the steps in any order. Thus, the holding of the previous claim rejections under Teeri et al. and with secondary references is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 34-36 and 39-41 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Teeri et al. (US 2004/0091977).

Claims 34-36 and 39-41 are drawn to a method of attaching a functional group to cellulosic material comprising attaching one or more functional groups to xyloglucan polymers to form modified xyloglucan polymers, hydrolyzing the modified xyloglucan

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polymer to prepare a xyloglucan conjugate, and treating a cellulosic material with the xyloglucan conjugate (claim 34); a limitation to the functional group being a dye molecule (claim 35); a limitation to the xyloglucan conjugate comprising more than one functional group (claim 36); a limitation to the cellulosic material being cotton (claim 39); a limitation to the step of hydrolysis being carried out by enzymatic digestion (claim 40); a limitation to the enzymatic digestion being carried out by endoglucanase (claim 41).

Teeri et al. teach that xyloglucan polymers can be chemically and/or enzymatically modified to contain a wide range of different chemical groups and that such chemically modified xyloglucan polymers can be used as an interface for introducing new chemical groups onto the cellulosic fiber surfaces (see paragraph 57). In detail, Teeri et al. teach a method of modifying polymeric carbohydrate materials such as cellulosic fiber (i.e. cotton, see paragraph 28) using a carbohydrate polymer fragments (or xyloglucan oligosaccharides or XGO) comprising a chemical group with functionality (i.e. an dye; see paragraph 34). The method of Teeri et al. teaches that XGO comprising a chemical group can be obtained by hydrolysis with endoglucanase (see Example 7).

Although Teeri et al. do not particularly teach the attachment of conjugates to xyloglucan polymer prior to the hydrolysis of the polymer to obtain xyloglucan conjugate, it would have been obvious for the person of ordinary skill in the art at the time the invention was made to attach a chemical group to xyloglucan polymer first and then hydrolyze xyloglucan polymer to obtain xyloglucan conjugate (carbohydrate linker molecule). M.P.E.P. § 2144 recites, "The rationale to modify or combine the prior art

does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law...If the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court." In *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946), the court found that selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. In *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930), the court found that selection of any order of mixing ingredients is *prima facie* obvious.

Therefore, the invention as a whole would have been *prima facie* obvious to a person of ordinary skill at the time the invention was made.

Claim 42 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Teeri et al. (US 2004/0091977) in view of Thurl et al. (1991).

Claim 42 is drawn to a limitation to the xyloglucan conjugate being purified by ultrafiltration (claim 42).

Teeri et al. teach the limitation of claim 34 (see above).

Although Teeri et al. do not teach the purification of xyloglucan conjugate being carried out by ultrafiltration, it would have been obvious for the person of ordinary skill in the art at the time the invention was made to use ultrafiltration as a technique to purify xyloglucan conjugates because ultrafiltration is well known in the art for purification of

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oligosaccharides as evidenced by Thurl et al. (1991; see Abstract).

The person of ordinary skill in the art would have had a reasonable expectation of success in using ultrafiltration in purification of carbohydrate polymer fragments (xyloglucan conjugates or XGO) since Thurl et al. successfully purify oligosaccharides using ultrafiltration.

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Claims 37, 38 and 43-45 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Teeri et al. (supra) in view of Gorbacheva et al. (US 4,407,748) and Barnabas et al. (US 6,613,733).

Claims are drawn to a limitation to the functional group being an antimicrobial agent (claim 37); a limitation to the dye molecule of claim 35 being an azo dye (claim 38); a limitation to the functional group in claim 34 being an antimicrobial agent (claim 43); a limitation to the xyloglucan conjugate in claim 36 comprising an antimicrobial agent (claim 44); a limitation to the xyloglucan conjugate of claim 44 comprising a dye (claim 45).

Teeri et al. teach the limitations of the method in claim 34 (see above).

Teeri et al. do not teach that the functional group attached to the xyloglucan polymers being an azo dye or an antimicrobial agent.

Gorbacheva et al. teach an azo dye molecule, which has an antimicrobial activity, impregnated by chemical bonding to the fiber-forming polymers (see Abstract and

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column 1, lines 25-29).

It would therefore have been obvious for the person of ordinary skill in the art at the time the invention was made to use the azo dye molecule having an antimicrobial activity as a functional group attached to the xyloglucan polymers in the method of Teeri et al.

The skilled artisan would have been motivated to make such a modification because since it is well known that textile materials such as cellulosic fiber (cotton; see Example 1) undergo biological degradation due to microorganisms, and also taught by Gorbacheva et al., the use of materials having antimicrobial properties makes it possible to extend the life of the materials (see column 1, lines 15-24). In addition, the use of dye in textile/clothes materials such as cottons is notoriously well known in the art.

The person of ordinary skill in the art would have had a reasonable expectation of success in using the azo dye material having antimicrobial activity taught by Gorbacheva et al. because this molecule has been used as a functional group attached to textile material such as cotton (see Example 1 of Gorbacheva et al.).

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

### ***Conclusion***

No claims are allowed.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE



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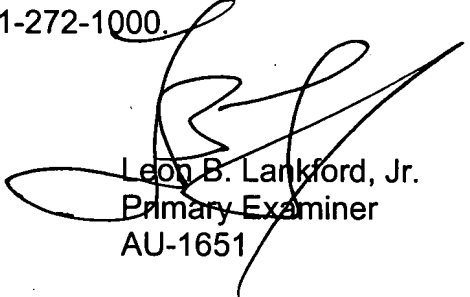
MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taeyoon Kim whose telephone number is 571-272-9041. The examiner can normally be reached on 9:00 am - 5:00 pm ET (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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